

Planning your first deep sky session

Introduction / Reason:

- makes better use to your telescope time
- ensures seeing new objects and sites
- aids with completion and progress through list (Messier)
- stretches your limits and widens your boundaries
- limits and goals will prevent frustration and boredom

Things to consider:

a) What is your skill level?

- first timers go for brighter objects
- there are 150 – 200 “showpiece” objects: Messier list, 10th magnitude and brighter, brighter NGC
- 1 to 5 years worth of viewing
- as your skill, equipment and experience increase, so will the faintness and number of objects

b) Where is your observing site?

City:

- deep sky observing severely compromised
- reduction of visual magnitude of 3 or 4
- 5.5 magnitude stars visible in country
- 2.5 magnitude stars visible in city
- similar reduction with optical equipment
- constellations much harder to find, and therefore objects in constellations hard or impossible to find

Country:

- find the darkest site you can
- many places within 30 – 45 minute drive
- will yield 5.5 magnitude stars over most of the sky
- Look at it this way: for 30 minutes worth of driving, you can triple the effective aperture of your optics, which is like increasing the dollar value by a factor of 10!
- makes constellation identification easy
- makes locating and observing deep-sky objects possible
- enhances contrast, making all views more rewarding

c) What optical equipment will you use?

Binoculars:

- everyone should have a pair; to use alone or as a locating aid with a telescope
- preference is for 8x40, 7x50 or 10x50 for use without a tripod
- preference is for 10x50, 10x70, 11x80, 20x80 and up for use with a tripod

- yields nice views of brightest Messier and NGC objects, including many open star clusters (eg: M45), some bright nebulae (eg: M42), and a few galaxies (eg: M31 and M33)
- exceptional for viewing the Milky Way, star clouds etc.
- limit is approx. 9th magnitude (8th magnitude extended)

Telescopes:

- the most important variable for planning is your aperture

1) **Small** (60 to 80 mm):

- brighter Messier and NGC objects
- low power yields large field of view
- limit is approx. 11th magnitude stars (10th magnitude extended)

2) **Medium** (90 – 150 mm):

- extremely versatile
- focal lengths of F5 to F8 are best
- up to 2 degrees wide field of view
- up to 200x magnification
- literally hundreds of objects to view
- limit is approx. 12th magnitude stars (10th – 11th extended)

3) **Large** (200 mm and up):

- versatility decreases as aperture increases
- narrower fields of view (200 mm = about 1 degree, 400 mm = about .5 degree)
- best used with fainter, deeper, smaller objects, especially globular clusters, galaxies and planetaries
- limit is about 12th – 15th magnitude stars (11th – 14th extended)
- focal ratios of F4 to F6 are best
- for more experienced observers
- probably thousands of objects to view

d) Which atlas, field guide or computer program will you use?

- a must for deep sky objects
- learn to use monthly or seasonal all-sky maps for constellation location, orientation and visibility
- you must learn to correlate the sky on the map to the real sky, then the constellation

Steps:

- 1) with month or season in mind, locate the appropriate all-sky map
- 2) determine constellation(s) of interest
- 3) locate specific constellation maps
- 4) on map, locate items to include in your deep-sky plan. Each map will have symbols to identify object type located within the constellation, and there will be a text page or adjacent description which will further describe size, magnitude, color and type of object. Note: The objects in your plan should be chosen according to interest, equipment, view site and plan limits.

- 5) Note on your plan the constellation name, chart or map number, object type, text page for field reference. May be compiled as a chart.
- 6) For a more intense plan, do research on each object using Burnham's Celestial Handbook or other field guide resource.

My choices for atlas and field guides are:

- i) The Observer's Sky Atlas by E. Karkoschka
- ii) Stars and Planets (Peterson) by Pasachoff
- iii) Nightwatch by Terrence Dickinson
- iv) Burnham's Celestial Handbook (3 volume set)

e) Why put limits on your plan?

- consider the time of year to determine practical allowable hours in observing session
- in winter, exposure of cold and wind limits session to 2 or 3 hours
- in summer, late sunset means starting at 10 pm, so 3 hour session ends at 1 am
- so, what is a practical number of objects to locate / observe in 2-3 hours?
- allow about 15 minutes to locate and appreciate each object.
- suggested maximum = 10 new objects per night
- use leftover time to view planets, the moon, or old favorites
- plan to take longer as objects get deeper and fainter

Some limit guides:

- 1) By constellation – Eg: all interesting and appropriate objects within the borders of one constellation.
- 2) By object type – Eg: all open clusters in the winter sky
- 3) By magnitude – Eg: all 5th magnitude showpiece objects in the fall sky
- 4) By list – Eg: all Messier objects in Scorpius and Sagittarius

Conclusion:

- remember to keep your plan and record your observations, impressions and reflections
- allows you to chart your progress and avoid duplicating observations
- allows you to note changes in your abilities, methods, effectiveness, and equipment
- casual, non-scientific notes are very interesting
- include further research as part of post-observing

Next month:

- putting your plan to use
- locating and observing deep-sky objects by a) proximity and triangulation (flop and plop) and b) star hopping (lost in space)

Sample deep-sky plan for early March

Limits: Open star clusters, 8th magnitude or brighter in the winter sky

Field Guide: Petersons

All-sky map: Map #2: pages 56 & 57

Constellations: Auriga, Gemini, Orion, Monoceros, Canis Major

Constellation Maps: #11, #12, #24, #25, #36

Targets:

				Petersons		Karoschka	
	#	Object	Constellation	Map #	Page #	Map #	Page #
^	1	M36	Auriga	11	249	N6	etc...
^	2	M37	Auriga	11	249	N6	
^	3	M38	Auriga	11	249	N6	
^	4	M35	Gemini	12	251	N5	
^	5	M42-43	Orion	24	282	E4	
*	6	NGC 2244	Monoceros	24	282	E9	
*	7	NGC 2264	Monoceros	24	282	E7	
*	8	M50	Monoceros	25	284	E11	
^	9	M67	Cancer	25	284	E9	
*	10	M48	Hydra	25	284	E10	
^	11	M46	Puppis	25	284	E8	
^	12	M47	Puppis	25	284	E8	
^	13	M41	Canis Major	36	309	E6	
*	14	M93	Puppis	36	309	E6	

Notes: * = primary targets, not seen before

^ = secondary targets, seen in previous session(s)